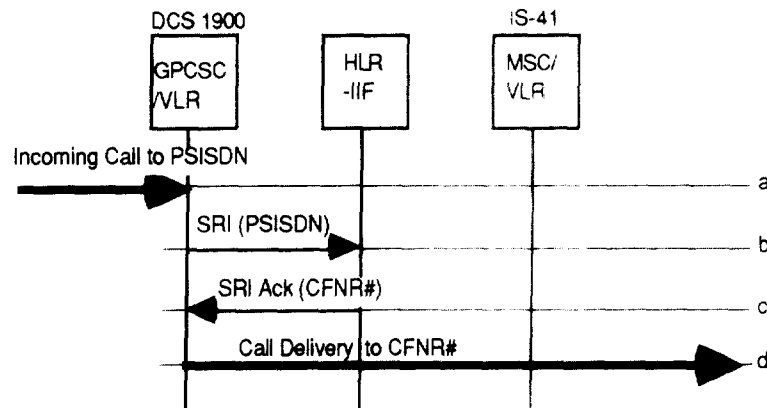


- 1 a. The incoming call to the PSISDN first reaches the DCS 1900
2 GPCSC.
- 3 b. The DCS 1900 GPCSC sends a query Send Routing
4 Information (SRI) to the HLR-IIF.
- 5 c. The HLR-IIF sends the Routing Request (ROUTREQ)
6 containing the MSCID (Originating) of the HLR-IIF (instead of
7 the DCS 1900 GPCSC) to the serving IS-41 MSC/VLR to
8 allow the serving IS-41 MSC/VLR to send the REDREQ to
9 the HLR-IIF.
- 0 d. The serving IS-41 MSC/VLR returns the routreq containing the
1 Temporary Local Directory Number (TLDN) to the HLR-IIF.
- 2 e. The HLR-IIF returns with the SRI ACK containing a Personal
3 Station Roaming Number (PSRN). (PSRN=TLDN).
- 4 f. The call is delivered from the DCS 1900 GPCSC to the serving
5 IS-41 MSC/VLR via the TLDN allocated by the serving IS-41
6 MSC/VLR.
- 7 g. When the No Page Response condition applies, the serving IS-
8 41 MSC/VLR sends Redirection Request (REDREQ) message
9 to the HLR-IIF based on MSCID (Originating) received from
0 the ROUTREQ message. (Note that in IS-41 revision C, "No
1 Page Response" indication is supported. However, in IS-41
2 revision B, "No Answer" indication is used for both "No
3 answer" and "No Page Response" conditions.)
- 4 h. The HLR-IIF rejects the redirection request.
- 5 i. The IS-41 MSC/VLR sends a Transfer To Number Request
6 (TRANUMREQ) to the HLR-IIF to ask for a CFNR number.
- 7 j. The HLR-IIF returns the tranumreq with a CFNR number.
- 8 k. The call is forwarded to the CFNR number from the serving IS-
9 41 MSC/VLR.
- 0

DCS 1900 Subscriber roaming into IS-41 Network Call Forwarding Before Call Delivery

Figure 6-11 describes the example message flow for the "PS Inactive" case. The same message flow applies to "Unavailable (before Call Delivery)", "Unroutable" cases.

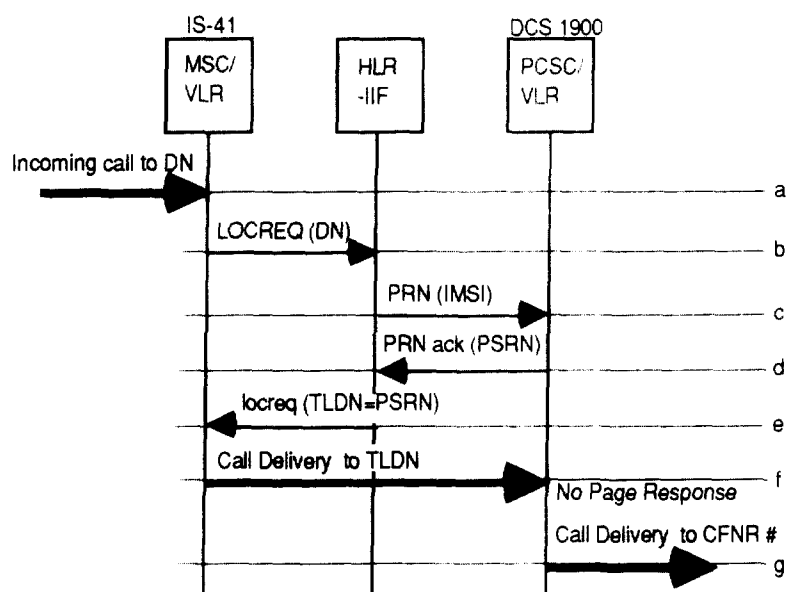


**Figure 6-11 CFNR - PS Inactive Case (DCS 1900
Subscriber roaming into IS-41 network)**

- a. The incoming call to the PSISDN first reaches the DCS 1900 GPCSC.
- b. The DCS 1900 GPCSC sends a query Send Routing Information (SRI) to the HLR-IIF.
- c. Once the HLR-IIF determines that the DCS 1900 Subscriber is inactive and has been CFNR activated, it returns with the SRI ACK containing the CFNR number.
- d. The call is forwarded to the CFNR number from the DCS 1900 GPCSC.

IS-41 Subscriber roaming into DCS 1900 Network Call Forwarding After Call Delivery

Figure 6-12 describes the example message flow for the "No Page Response" case. The same message flow applies to the "Radio Congestion" and "PS has become not reachable in the VLR after PRN Ack" cases.



**Figure 6-12 CFNR - No Page Response Case
(IS-41 Subscriber roaming into DCS 1900 network)**

- a. The incoming call to DN first reaches the IS-41 MSC.
- b. The IS-41 MSC sends a query Location Request (LOCREQ) to the HLR-IIF.
- c. The HLR-IIF sends a Provide Roaming Number (PRN) to the serving DCS 1900 PCSC/VLR.
- d. The serving DCS 1900 PCSC/VLR returns with the PRN ACK containing a Personal Station Roaming Number (PSRN) to the HLR-IIF.
- e. The HLR-IIF returns with the locreq containing the Temporary Local Directory Number (TLDN) to the IS-41 MSC (TLDN=PSRN).
- f. The call is delivered from the IS-41 MSC to the serving DCS 1900 PCSC via the PSRN allocated by the serving DCS 1900 PCSC.
- g. When the No Page Response condition applies, the call is forwarded to the CFNR number from the serving PCSC/VLR.

IS-41 Subscriber roaming into DCS 1900 Network

Call Forwarding Before Call Delivery

Figure 6-13 describes the example message flow for the "PS not reachable in VLR" case. The same message flow applies to the "PS Deregistered" and "Purged" cases, except that steps c and d are omitted.

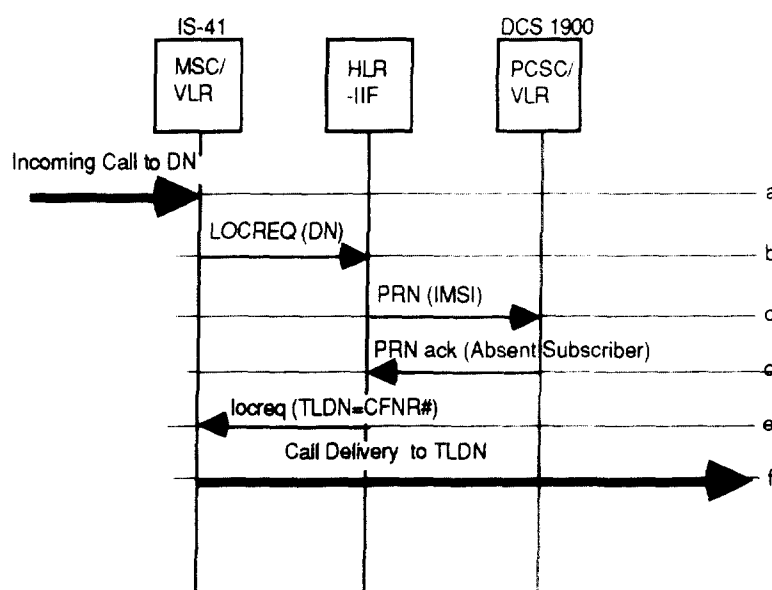


Figure 6-13 CFNR - IMSI Detach Case
(IS-41 Subscriber roaming into DCS 1900 network)

- a. The incoming call to DN first reaches the IS-41 MSC.
- b. The IS-41 MSC sends a query Location Request (LOCREQ) to the HLR-IIF.
- c. The HLR-IIF sends a Provide Roaming Number (PRN) to the serving DCS 1900 PCSC/VLR.
- d. The serving DCS 1900 PCSC/VLR returns with the PRN ACK containing an Absent Subscriber indication to the HLR-IIF.
- e. The HLR-IIF returns with the locreq containing the CFNR number to the IS-41 MSC.
- f. The call is forwarded to the CFNR number from the originating MSC/VLR.

6.4 Call Hold and Retrieve

For further study.

6.5 Call Transfer

For further study.

6.6 Call Waiting (CW)

DCS 1900 Subscriber roaming into IS-41 Network

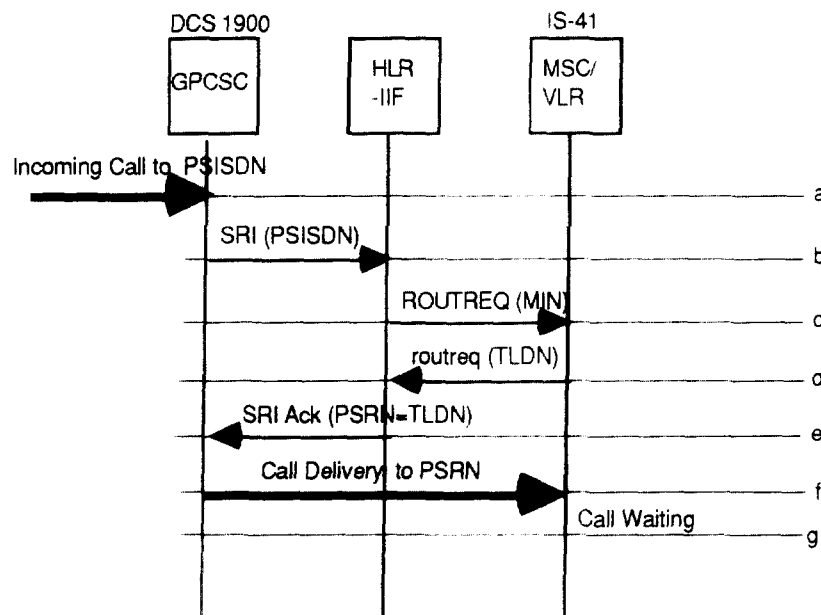


Figure 6-14 CW
(DCS 1900 Subscriber roaming into IS-41 network)

The precondition to Call Waiting is that DCS 1900 Subscriber (roaming into IS-41 network) is already engaged in a call while the second call to DCS 1900 Subscriber is initiated.

- a. The incoming call to the PSISDN first reaches the DCS 1900 GPCSC.
- b. The DCS 1900 GPCSC sends a query Send Routing Information (SRI) to the HLR-IIF.
- c. The HLR-IIF sends a Routing Request (ROUTREQ) to the serving IS-41 MSC/VLR.
- d. Once the serving IS-41 MSC/VLR determines that the DCS 1900 Subscriber is busy and has been call waiting activated, it

- 1 returns the routreq containing the Temporary Local Directory
2 Number (TLDN) to the HLR-IIF
- 3 e. The HLR-IIF returns with the SRI ACK containing Personal
4 Station Roaming Number (PSRN). (PSRN=TLDN).
- 5 f. The call is delivered from DCS 1900 GPCSC to the serving IS-
6 41 MSC/VLR via the TLDN allocated by the serving IS-41
7 MSC/VLR.
- 8 g. After the call reaches serving IS-41 MSC/VLR, the CW is
9 applied to the DCS 1900 Subscriber.

IS-41 Subscriber roaming into DCS 1900 Network

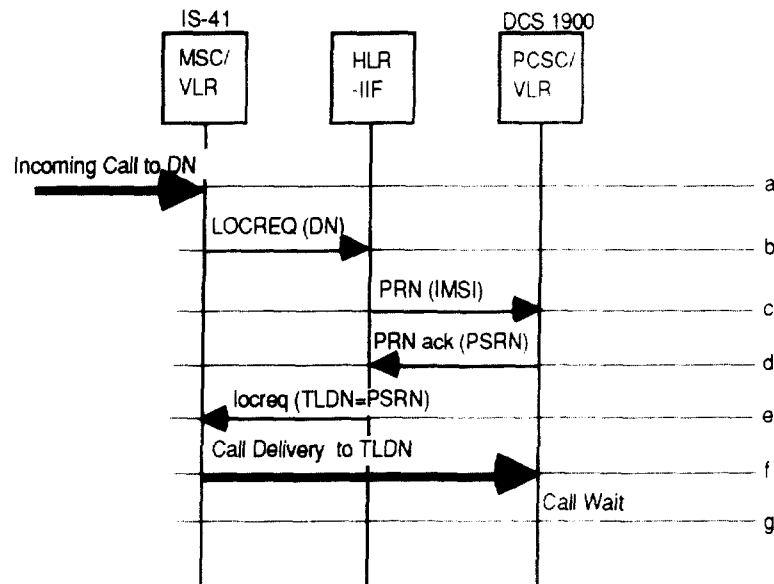


Figure 6-15 CW
(IS-41 Subscriber roaming into DCS 1900 network)

The precondition to Call Waiting is that the IS-41 Subscriber (roaming into DCS 1900 network) is already engaged in a call while the second call to IS-41 Subscriber is initiated.

- a. The incoming call to DN first reaches the IS-41 MSC
- b. The IS-41 MSC sends a query Location Request (LOCREQ) to the HLR-IIF.
- c. The HLR-IIF sends a Provide Roaming Number (PRN) to the serving DCS 1900 PCSC/VLR.
- d. The serving DCS 1900 PCSC/VLR returns with the PRN ACK containing a Personal Station Roaming Number (PSRN) to the HLR-IIF.
- e. The HLR-IIF returns with the locreq containing the Temporary Local Directory Number (TLDN) to the IS-41 MSC (TLDN=PSRN).
- f. The call is delivered from the IS-41 MSC to the serving DCS 1900 PCSC via the PSRN allocated by the serving DCS 1900 PCSC.
- g. After the call reaches serving DCS 1900 PCSC/VLR, the CW is applied to the IS-41 Subscriber.

6.7 Calling Number Identification Presentation

In DCS 1900, Calling Number Identification Presentation (CNIP) service is supported without the support of Calling Number Identification (CNI) information in the MAP protocol. Instead, the CNI information is carried through the ISUP protocol between PCSCs in the DCS 1900 network. The DCS 1900 network was designed to be a digital network since day 1. Since ISUP protocol supports more features than CNI information, it is used throughout DCS 1900 network.

In IS-41, however, some MSCs can only support MultiFrequency (MF) signaling between MSCs. Since MF signaling may not carry CNI information, IS-41 revision C protocol provides CNI information in LOCREQ and ROUTREQ messages. If SS7 ISUP is used end-to-end, the IAM message can be used to deliver CNI information.

In order to avoid any impact on both the DCS 1900 MAP protocol and the IS-41 MAP protocol, it is assumed that the CNIP supplementary service will be provided with the support of SS7 ISUP protocol. That is, an end-to-end SS7 ISUP connectivity between the gateway MSC and the serving MSC (possibly via the PSTN and ISDN) is required to make the CNI information available to the serving MSC. It is also assumed that the serving IS-41 MSC/VLR has the "logic" to extract the CNI information in the ISUP IAM message and present the CNI information to the subscriber.

DCS 1900 Subscriber roaming into IS-41 Network

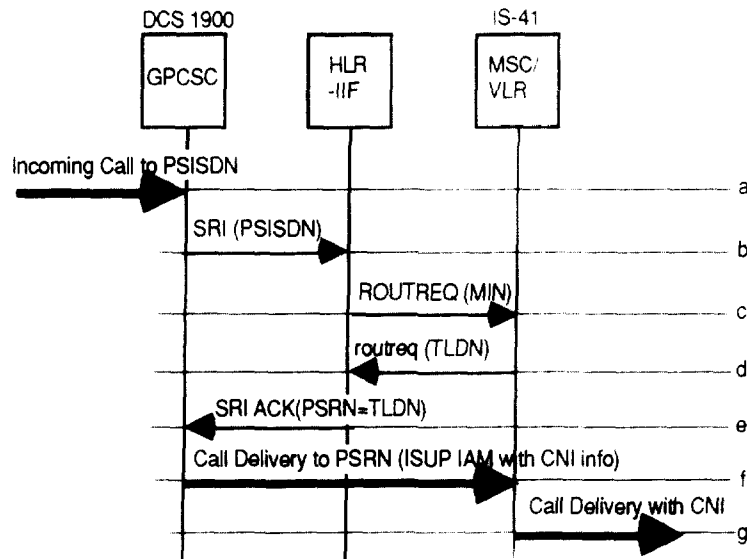


Figure 6-16 CNIP
(DCS 1900 Subscriber roaming into IS-41 network)

- a. The incoming call to the PSISDN with the Calling Number Identification (CNI) information first reaches the DCS 1900 GPCSC.
- b. The DCS 1900 GPCSC sends a query Send Routing Information (SRI) to the HLR-IIF.
- c. The HLR-IIF sends the Routing Request (ROUTREQ) to the serving IS-41 MSC/VLR.
- d. The Serving IS-41 MSC/VLR returns the routreq containing the Temporary Local Directory Number (TLDN) to the HLR-IIF.
- e. The HLR-IIF returns with the SRI ACK containing the Personal Station Roaming Number (PSRN). (PSRN=TLDN).
- f. The call is delivered using the ISUP protocol from DCS 1900 GPCSC to the serving IS-41 MSC/VLR via the TLDN allocated by the serving IS-41 MSC/VLR. The ISUP IAM message is used to deliver CNI information.
- g. After the call reaches serving IS-41 MSC/VLR, the CNI is delivered to the DCS 1900 Subscriber.

IS-41 Subscriber roaming into DCS 1900 Network

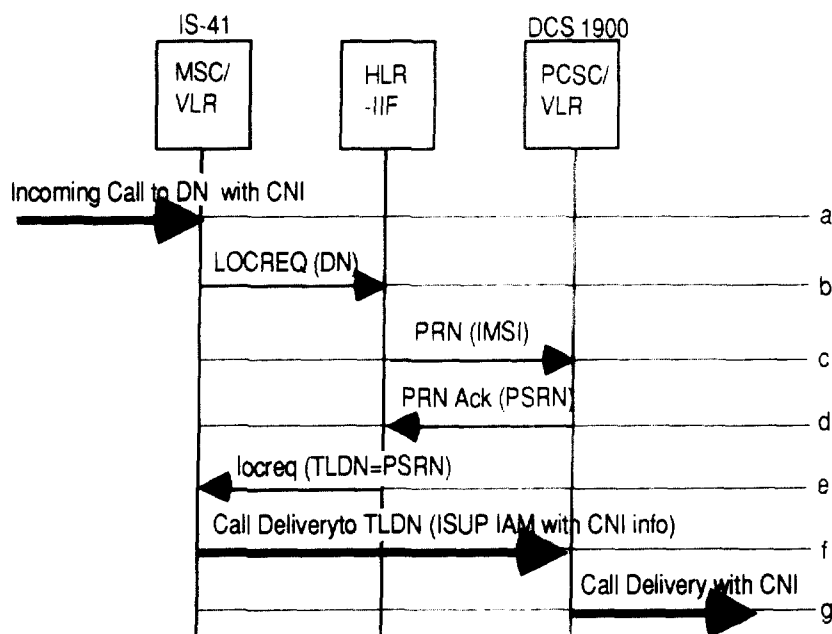


Figure 6-17 CNIP
(IS-41 Subscriber roaming into DCS 1900 network)

- a. The incoming call to DN with the Calling Number Identification (CNI) information first reaches IS-41 MSC.
- b. The IS-41 MSC sends a query Location Request (LOCREQ) to the HLR-IIF.
- c. The HLR-IIF sends the Provide Roaming Number (PRN) to the serving DCS 1900 PCSC/VLR.
- d. The Serving DCS 1900 PCSC/VLR returns with the PRN ACK containing Personal Station Roaming Number (PSRN) to the HLR-IIF.
- e. The HLR-IIF returns with the locreq containing Temporary Local Directory Number (TLDN) to the IS-41 MSC (TLDN=PSRN).
- f. The call is delivered using ISUP protocol from IS-41 MSC to the serving DCS 1900 PCSC via the PSRN allocated by the serving DCS 1900 PCSC. The ISUP IAM message is used to deliver CNI information.
- g. After the call reaches serving DCS 1900 PCSC/VLR, the CNI is delivered to the IS-41 Subscriber.

6.8 Calling Number Identification Restriction

For further study

6.9 Conference Calling

For further study

6.10 Flexible Alerting

For further study

6.11 Intercept Access Service

For further study

6.12 Message Waiting Notification

For further study

6.13 Multi-Way Calling (MWC)

The Multi-Way Calling in DCS 1900 is called Multiparty (MPTY) call and is mapped to Conference Calling (CC) in IS-41 Rev. C. The maximum number of remote parties in MPTY is 5 while the maximum number of remote parties in Conference Calling is dependent upon the local service provider. Both services are activated upon subscription. The conferencing circuit is provided at the MSC. No interworking is required at the HLR-IIF.

6.14 Multi-level Precedence & Preemption (MLPP)

For further study

6.15 Priority Access and Channel Assignment

For further study

6.16 Reverse Charging

For further study

6.17 Short Message Service

For further study

6.18 Smart Card

For further study

6.19 Voice Privacy Service

For further study

Informative Appendix A - IS-41 Operations

These operations need to be considered within the context of the inter-PCN service scenarios which will be evaluated for I&I

Table 1 lists the IS-41 intersystem operations which are utilized in various roaming scenarios. Associated with each operation is a set of Invoking and Responding Network Element pairs.

IS-41 OPERATION	IS-41 Rev.	Invoking NE	Responding NE
Authentication Directive (by AC/HLR)	Rev. C	HLR	Serving MSC
Authentication Request (by serving system)	Rev. C	Serving VLR	HLR
Base Station Challenge	Rev. C	Serving VLR	HLR
Call History Count request	Rev. C	HLR	Serving VLR
CSSInactive	Rev. B	Serving VLR	HLR
Feature Request	Rev. C	Serving MSC Serving MSC (thru VLR)	HLR HLR
Information Directive	Rev. C	HLR	Serving VLR
Inter-System Page	Rev. C	Serving MSC	Border MSC
Inter-System Setup	Rev. C	Serving MSC	Border MSC
Location Request	Rev. B, C	Originating MSC	HLR
MS Deregistration	Rev. C	Serving VLR	HLR
MS Inactive	Rev. C	Serving MSC	HLR
Origination Request	Rev. C	Serving MSC	HLR
Qualification Directive	Rev. B, C	HLR	Serving VLR
Qualification Request	Rev. B, C	Serving VLR	HLR
Redirection Request	Rev. B, C	Serving MSC	Origin. MSC
Registration Cancellation	Rev. B, C	HLR	Previous VLR
Registration Notification	Rev. B, C	Serv/Border VLR	HLR
Remote Feature Control Request	Rev. B	Serving MSC Serving MSC (thru VLR)	HLR HLR
Remote User Interaction Directive	Rev. C	HLR	RUI-MSC
Routing Request	Rev. B, C	HLR	Serving VLR
Security Status Report	Rev. C	Serving VLR	HLR
Transfer To Number Request	Rev. B, C	Orig/Serv MSC	HLR
Unsolicited Response	Rev. C	Border MSC	Serving MSC
Bulk Deregistration	Rev. C	Serving VLR	HLR
Unreliable Roamer Data Directive	Rev. B, C	HLR	Serving VLR

Table 1: IS-41 Roaming Operations

Table 2 lists the IS-41 intersystem operations which are utilized in various handoff scenarios. Associated with each operation is a set of Invoking and Responding Network Element pairs.

IS-41 OPERATION	IS-41 Rev. Operation	Invoking NE	Responding NE
Authentication Directive Forward	Rev. C	Anchor MSC Anchor MSC Tandem MSC	Serving MSC Tandem MSC Serving MSC
Facilities Directive	Rev. B, C	Anchor MSC Serving MSC Tandem MSC	Target MSC Target MSC Target MSC
Facilities Directive 2	Rev. C	Anchor MSC Serving MSC Tandem MSC	Target MSC Target MSC Target MSC
Facilities Release	Rev. B, C	MSC	MSC
Flash Request	Rev. C	Serving MSC Serving MSC Tandem MSC Tandem MSC	Anchor MSC Tandem MSC Tandem MSC Anchor MSC
Handoff Back	Rev. B, C	Serving MSC	Target MSC
Handoff Back 2	Rev. C	Serving MSC	Target MSC
Handoff Measurement Request	Rev. B, C	Serving MSC	Adjacent MSC
Handoff Measurement Request 2	Rev. C	Serving MSC	Adjacent MSC
Handoff to Third	Rev. B, C	Serving MSC Serving MSC Tandem MSC	Anchor MSC Tandem MSC Tandem MSC
Handoff to Third 2	Rev. C	Serving MSC Serving MSC Tandem MSC	Anchor MSC Tandem MSC Tandem MSC
Information Forward	Rev. C	Anchor MSC Anchor MSC Tandem MSC	Serving MSC Tandem MSC Serving MSC

Table 2: IS-41 Handoff Operations

Table 3 lists the IS-41 intersystem operations which are utilized for Short Message Service.
Associated with each operation is a set of Invoking and Responding Network Element pairs.

IS-41 OPERATION	IS-41 Rev. Operation	Invoking NE	Responding NE
Short Message Delivery Point-to-Point	Rev. C	SME MC MC	MC MC SME
Short Message Delivery Forward	Rev. C	MSC	MSC
Short Message Delivery Backward	Rev. C	MSC	MSC
Destination Request	Rev. C	MC HLR	HLR VLR
Service Notification	Rev. C	HLR	MC

Table 3: IS-41 Short Message Service Operations

Informative Appendix B - DCS 1900 Operations

These operations need to be considered within the context of the inter-PCN service scenarios which will be evaluated for I&I.

Table 1 lists the DCS 1900 intersystem operations which are utilized in various roaming scenarios. Associated with each operation is a set of Invoking and Destination Network Element pairs.

DCS 1900 OPERATION	Invoking NE	Destination NE
MAP_INSERT_SUBSCRIBER_DATA	HLR	Serving VLR
MAP_DELETE_SUBSCRIBER_DATA	HLR	Serving VLR
MAP_RESET	HLR	Serving VLR
MAP_FORWARD_CHECK_SS_INDICATION	HLR	Serving VLR
MAP_PROVIDE_ROAMING_NUMBER	HLR	Serving VLR
MAP_UPDATE_LOCATION	Serving VLR	HLR
MAP_CANCEL_LOCATION	HLR	Serving VLR
MAP_SEND_IDENTIFICATION	Serving VLR	Previous VLR
MAP_PURGE_PS	Serving VLR	HLR
MAP_SEND_AUTHENTICATION	Serving VLR	HLR

Table 1 DCS 1900 Operations Related To Call Handling And Roaming

Table 2 lists the DCS 1900 intersystem operations which are utilized in various handoff scenarios. Associated with each operation is a set of Invoking and Destination Network Element pairs.

DCS 1900 OPERATION	Invoking NE	Destination NE
MAP_PREPARE_HANOVER	Anchor PCSC(A)	Target PCSC(B)
MAP_PROCESS_ACCESS_SIGNALING	Serving PCSC(B)	Anchor PCSC(A)
MAP_SEND_END_SIGNAL	Serving PCSC(B)	Anchor PCSC(A)
MAP_FORWARD_ACCESS_SIGNALING	Anchor PCSC(A)	Serving PCSC(B)
MAP_PREPARE_SUBSEQUENT_HANOVER	Serving PCSC(B)	Anchor PCSC(A)

Table 2 DCS 1900 Operations Related To Handoff / Handover

Table 3 lists the DCS 1900 intersystem operations which are utilized for Short Message Service. Associated with each operation is a set of Invoking and Destination Network Element pairs.

DCS 1900 OPERATION	Invoking NE	Destination NE
MAP_FORWARD_SHORT_MESSAGE	Gateway PCSC	Serving PCSC
MAP_READY_FOR_SM	Serving VLR	HLR

Table 3 DCS 1900 Operations Related To Short Message Service

Table 4 lists the DCS 1900 intersystem operations which are utilized for Supplementary Services management. Associated with each operation is a set of Invoking and Destination Network Element pairs

DCS 1900 OPERATION	Invoking NE	Destination NE
MAP_REGISTER_SS	Serving VLR	HLR
MAP_ERASE_SS	Serving VLR	HLR
MAP_ACTIVATE_SS	Serving VLR	HLR
MAP_DEACTIVATE_SS	Serving VLR	HLR
MAP_INTERROGATE_SS	Serving VLR	HLR
MAP_REGISTER_PASSWORD	Serving VLR	HLR
MAP_GET_PASSWORD	HLR	Serving VLR
MAP_PROCESS_UNSTRUCTURED_SS_REQUEST	Serving VLR	HLR
MAP_UNSTRUCTURED_SS_REQUEST	HLR	Serving VLR
MAP_UNSTRUCTURED_SS_NOTIFY	HLR	Serving VLR

Table 4 DCS 1900 Operations Related To Supplementary Services

Informative Appendix C

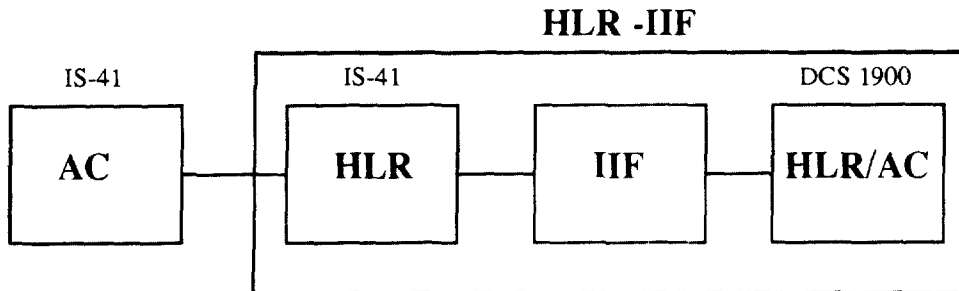


Figure C-1: Logical Functionality of HLR-IIF

In Figure C-1 the HLR is the IS-41 HLR function, the IIF is the Interworking/Interoperability Function, and the HLR/AC is the DCS 1900 HLR function and AC function.

Note 1: The interworking functionality of an IS-41 and DCS 1900 dual band subscriber is assumed in the IIF in order to support unmodified IS-41 MAP to the IS-41 network and unmodified DCS 1900 MAP to the DCS 1900 network.

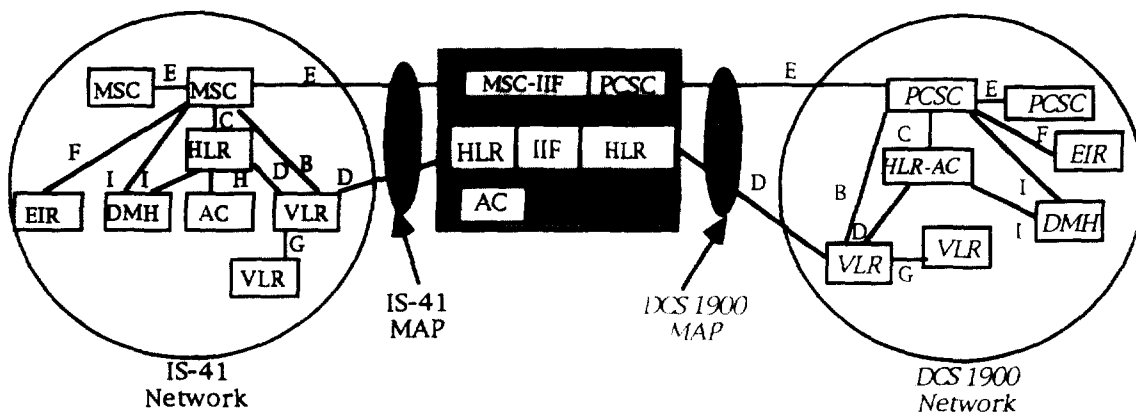


Figure C-2: IIF Located Remotely From IS-41 Visited Network and DCS 1900 Visited Network

Note 2: The interworking functionality of an IS-41 and DCS 1900 dual band subscribers are assumed in the home IS-41 network cluster in order to support unmodified DCS 1900 MAP to the DCS 1900 network.

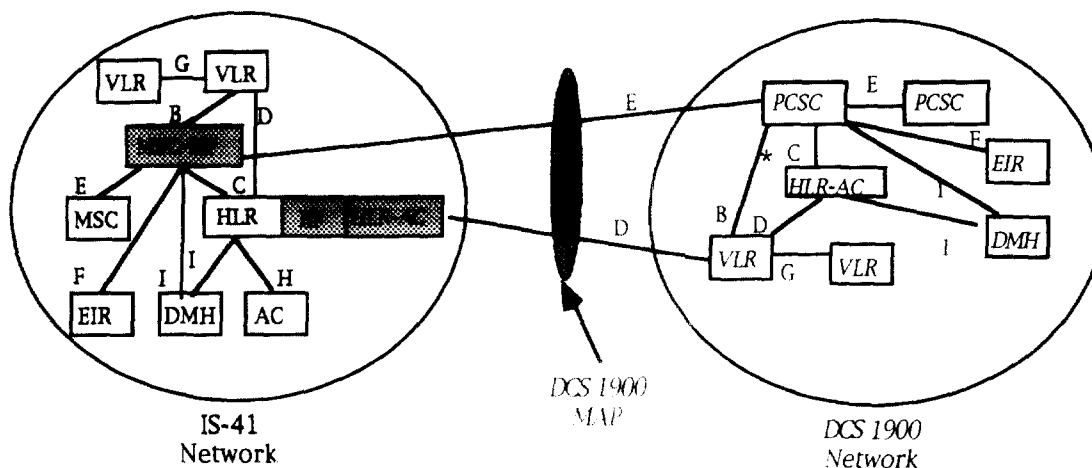


Figure C-3: IIF Contained Within Home IS-41 Network

* HLRs not containing Dual Mode Subscriber database information are shaded

Note 3: The interworking functionality of an IS-41 and DCS 1900 dual band subscriber is assumed in the home DCS 1900 network cluster in order to support unmodified IS-41 MAP to the IS-41 network

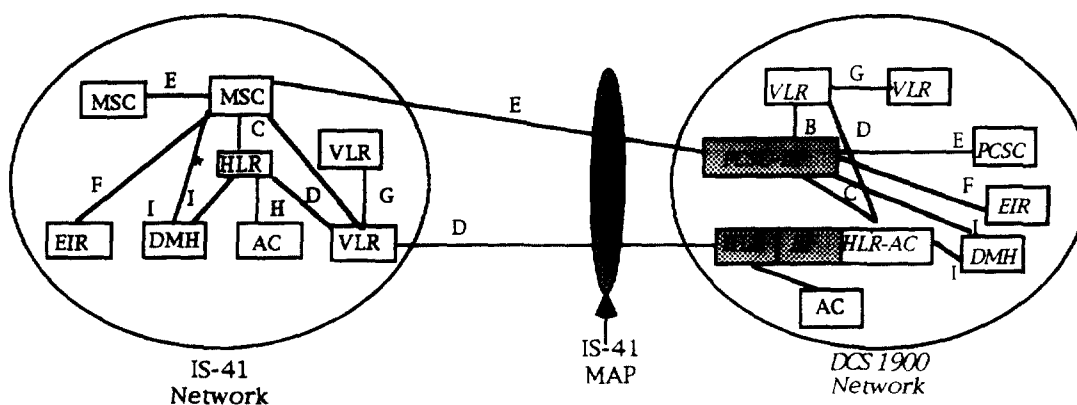


Figure C-4: IIF Contained Within DCS 1900 Home Network

Bulletin

the voice of the personal communications industry

Vol. 96, No. 22

June 14, 1996

FCC Adopts Interim Rules Governing Resale Commissioners Say Rules Will Help Consumers, New Wireless Entrants

To make it easier for new entrants into the wireless industry to compete with entrenched competitors, the FCC adopted interim rules governing the resale obligations of cellular, broadband PCS and SMR providers licensees in the 800 MHz and 900 MHz bands providing real-time, two-way switched, interconnected voice service. The interim rules would prohibit these entities from unfairly restricting the resale of their services.

In This Week's Issue

FCC Establishes 911 and E911 Service Guidelines for Wireless 2

Ericsson Outlines New Products and Its Stance on CDMA and IS 95 3

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Under its current rules, the FCC restricts cellular licensees from unreasonably restricting or disallowing the resale of their services or unreasonably discriminating against resellers. Extending this rule to broadband PCS and wide-area SMR providers will benefit consumers by promoting competitive pricing and by making it difficult for carriers to engage in unreasonable price discrimination, the commission believes. Additionally, the availability of resale opportunities will help jump-start competition by allowing new entrants to establish themselves quickly by reselling the services of their competitors while they build their own networks.

In its ruling (CC Docket No. 94-54), the FCC eliminated an exception to its existing cellular resale rule that allows a cellular licensee to restrict the sale of its services by the other cellular licensee in the same geographic area after expiration of the five-year period that the other licensee is granted to build out its system under the commission's rules. This exception was adopted in 1992 on the basis that it would promote competition by encouraging facilities-based carriers to build-out their systems. However, the FCC decided that the exception is no longer necessary because most cellular build-out periods ended several years ago and because the use of auctions as a licensing mechanism, and the interim nature of the resale rules adopted, will adequately curtail "free rider" incentives.

Dual-Mode Phone, Personal Communicator in the Works

Ericsson believes dual-band systems are the key to new market opportunities. To that end, the company announced plans to introduce a dual-mode phone in the next quarter. Michael Parker, vice president of marketing operations for Ericsson Cellular Phones, said Ericsson's dual-mode D-AMPS 1900/800 MHz phone will have pager and short messaging capabilities and will automatically switch between 1900 MHz and 800 MHz systems without requiring the user to do anything. Parker also provided some preliminary information about the personal communicator Ericsson plans to release. The device will represent a convergence of devices, combining the benefits of a personal digital assistant (PDA) and cellular phone and pager into a device that is not much larger than a current cellular phone. Parker said the communicator will be compatible with all the popular PC software so users can download information; it will be able to access the Internet; serve as an address book, calendar and to-do list; and have fax and e-mail capabilities. The device will have an LCD display that will hold 80 characters across and 35 characters high and a typewriter-style keypad and will use a pen-stylus/mouse-like device.

Parker said Ericsson is developing a dual-mode satellite/cellular phone that will work on a satellite network being built and launched by Lockheed Martin. The satellite, scheduled to launch in late 1998 or early 1999, will serve the Asia-Pacific region. Parker said the phone will automatically pick the system--satellite or cellular--that is most readily available.

To support dual-mode phones such as the one it will introduce, Ericsson plans to release an interlocation register (ILR) by year's end. Miller said the ILR is a database that, when installed by a carrier, would allow its customers to roam from a PCS 1900 systems to an AMPS system.○

Texas Instruments Prepares for the Future With High-Capacity Timeline Technology Chip

Texas Instruments (TI) introduced a new chip that may be the beginning of significant changes in wireless phones. TI's Timeline Technology chip packs 125 million transistors onto one chip. That is roughly the same number of transistors found in a high-end personal computer, including the central processing unit, motherboard chips, modem, sound card, hard disk drive *and* 16 megabytes of dynamic random access memory. TI says its Timeline chip will facilitate the creation of cellular and PCS phones that weigh less, cost less and have more power than any mobile phone currently available.

Cellular and PCS phones may not need the 125 million transistor density, but they can benefit from the Timeline Technology in terms of reduced power consumption. According to TI, a device will be capable of performance at 300 MHz, 500 MHz or at 1.8V, and it will be able to deliver the 100 MHz needed by wireless sets at only 1V using the Timeline chip.

"The Timeline chip produces high-quality processing for less. Having 125 million transistors on a single chip means fewer chips, making the system faster and quieter while reducing the need for power," said Thomas Brooks, TI DSP (digital signal processor) marketing manager for wireless communications.

Because the Timeline chip allows the phone to be smaller and lighter, batteries can provide more talk and standby time to users. The Timeline chip will also give TI's customers a competitive advantage. "There is pressure for our customers to be more competitive to gain subscribers, and we are helping them by getting more and more functionality with one chip," Brooks said. The chip will also lower the cost of the phone it is in--savings that could be passed onto TI customers and eventually end-users, Brooks said.

Avoiding Pitfalls in the Design Jungle